PORTABLE WATER TURBINE

PROJECT REFERENCE NO.: 40S_BE_0036

COLLEGE : NEW HORIZON COLLEGE OF ENGINEERING, BENGALURU
BRANCH : DEPARTMENT OF MECHANICAL ENGINEERING
GUIDE : PROF. KADOLE PAVAN PRABHAKAR
STUDENTS : MR. RAKHESH H.S.
          MR. DAMODAR R.
          MR. MRUTHYUNJAYA K.N.
          MR. NAVEEN

Keywords: Tesla, turbine, portable, water, boundary plates, eddy currents, magnets, centripetal.

Objectives:
• To design a portable water turbine to generate power from renewable resource (RIVERS).
• To study the potential of renewable energy source in the effluent discharge of rivers.
• To help the farmers of the country to benefit from the generated power.
• To help the common man with its portability and efficiency.

Introduction:

The figure shows a water turbine with the Tesla turbine incorporated within it. The reason for selecting this turbine is that it does not consist of any vanes but utilizes plates as the vanes. The impact of water on the plates exerts a centripetal force causing it to rotate. The water creates vortex inside the casing, escaping through the centre of the plates and out of the turbine. With reference to survey it was found that the maximum amount of loss was found to be during the exit of the water through the centre of the plates, hence we have introduced a bend with reference to the nozzle angle for better performance. The best part about this turbine is that it can be used for multiple applications since the design by Tesla is highly efficient. This turbine is very stable at high rotating speeds.

Magnets are fixed to the inner side of the outer plates out of which the eddy currents generated by the rubbing action of copper stator is stored into cells or batteries for potential uses. This design is highly versatile from its working to its range of applications. Modifications can further made to this design by using magnetic bearings to cut off the frictional losses during the transmission of energy.

Methodology:
The plates were first designed in solid edge using the design constraints found in the literature survey, using these design constraints we have designed a turbine suitable for our specifications. The plates have been slightly modified to improve the overall performance of the plates. We have used stainless steel (SS304) material for the fabrication of the plates as it is known for its corrosion resistant properties, for the shaft we used aluminium material for its light weight and easy machining. The bearing that were used were a set of magneto bearings L-17 model.

**Flowchart:**

**Application of the project:**
- This turbine can be used for generation of electricity from rivers.
- Energy can also be generated from compressed air.
- This can also be used to regenerate energy lost by hydraulic pumps.